Made by : mahmoud alhalawani

MSS

- Anatomy
  - Bones (206)
    - 126 appendicular.
    - 80 Axial.
  - Joint
    - maintain structural stability.
    - movable or not-movable.

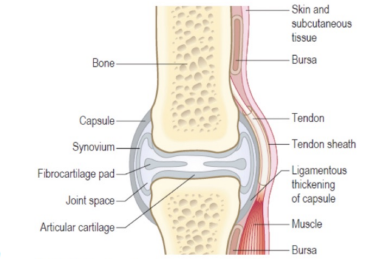
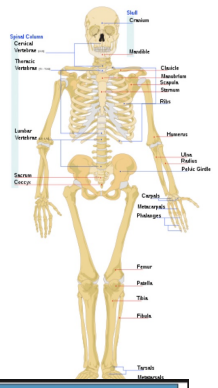


Fig. 13.1 Structure of a joint and surrounding tissues.



- Common presenting symptoms
  - pain
  - stiffness
  - swelling
  - Erythema & warmth.
  - Locking & triggering.
  - Extra-articular symptoms

13.1 Common causes of arthralgia (joint pain)

Infective	
• Viral, e.g. rubella, parvovirus B19, mumps, hepatitis B, chikungunya	
• Bacterial, e.g. staphylococci, *Mycobacterium tuberculosis*, *Borrelia*	(Lyme)
• Fungal	
Postinfective	
• Rheumatic fever :- S.pyogen	
• Reactive arthritis	
Inflammatory	
• Rheumatoid arthritis	
• Systemic lupus erythematosus	
• Ankylosing spondylitis	
• Systemic sclerosis	
Degenerative	
• Osteoarthritis :- not true inflammation	
Tumour	
• Primary, e.g. osteosarcoma, chondrosarcoma	
• Metastatic, e.g. from lung, breast, prostate	
• Systemic tumour effects, e.g. hypertrophic pulmonary osteoarthropathy	
Crystal formation	
• Gout, pseudogout	
Trauma	
• e.g. Road traffic accidents	
Others	
• Chronic pain disorders, e.g. fibromyalgia (usually diffuse pain)	
• Benign joint hypermobility syndrome	

13.2 Causes of muscle pain (myalgia)

Infective	
• Viral: Coxsackie, cytomegalovirus, echovirus, dengue	
• Bacterial: *Streptococcus pneumoniae*, *Mycoplasma*	
• Parasitic: schistosomiasis, toxoplasmosis	
Traumatic	
• Tears	
• Haematoma	
• Rhabdomyolysis :- espically after electrical shock.	
Inflammatory	
• Polymyalgia rheumatic	
• Myositis :- muscle inflammation	
• Dermatomyositis :- muscle & skin inflammation (rash)	
Drugs	
• Alcohol withdrawal	
• Statins :- ↑Lipid	
• Triptans :- migrane & cluster headache.	
Metabolic	
• Hypothyroidism	
• Hyperthyroidism	
• Addison's disease	
• Vitamin D deficiency	
Neuropathic	

1. Pain (SOCRATES).
   - Site
     - involved component
       - Bone
       - Tendons
       - Joint
       - muscle
       - Ligament
     - Local or multiple involvement.
     - gout:- metatarsophalangeal Joint (Red, Hot, tender)
     - Inflammatory arthritis:- swelling of several Joints.

   - Onset
     - immediate :- traumatic injury (↑ by movement or haemarthrosis).
     - acute, sever, Quickly, overnight:- crystal type (goat or pseudogoat).
     - within 24h :- inflammatory type.
     - more than 24h (1-2d) :- septic type.
   - Character
     - Localized
       - osteoid tumor (Benign).
       - osteomyelitis (inflammation).
       - osteonecrosis.
     - Diffuse (generalized) → osteomalacia.
     - Bone pain :- penetrating, deep & boring mainly at night.
     - muscle pain :- stiffness & aching mainly with movement.
     - Nerve pain
       - shooting caused by peripheral nerve or root impingement
       - example :- Lumbar disc protrusion → Buttock pain shoots down the back of the Leg.
     - Fracture
       - sharp & stabbing.
       - ↑ by :- movement.
       - ↓ by :- Rest & plintage.
     - progressive → degenerative type, osteoarthritis (>40y).
     - constant with diural variation (change throught the day) :- fibromylagia (chronic pain syndrome).
       - poorly controlled by conventional analgesic/anti-inflammatory drugs.
   - Radiation :- pain from nerve compression radiates to the distribution of that nerve or nerve root.
     - Lower Leg :- inter-vertebral disc prolapse.
     - Hand :- carpal tunnel syndrome
     - Neck :- shoulder or scalp.
     - Hip :- groin, thigh or knee.

13.3 Common patterns of referred and radicular musculoskeletal pain

Site where pain is perceived	Site of pathology
Occiput	C1, 2
Interscapular region	C3, 4
Tip of shoulder, upper outer aspect of arm	C5
Interscapular region or radial fingers and thumb	C6, 7
Ulnar side of forearm, ring and little fingers	C8
Medial aspect of upper arm	T1
Chest	Thoracic spine
Buttocks, knees, legs	Lumbar spine
Lateral aspect of upper arm	Shoulder
Forearm	Elbow
Anterior thigh, knee	Hip
Thigh, hip	Knee

- Associated symptoms → inflammatory arthritis
  - swelling.
  - Redness.
- Timing :- frequency, duration & periodicity of symptoms.
  - intermittent + Resolution between episodes :- palindromic rheumatism.
  - flitting pain (from one Joint to another) over days
    - Rheumatic fever.
    - gonoccocal arthritis.
  - several weeks of early morning stiffness :- inflammatory arthritis.
  - several years + normal examination :- fibromyalgia.
- Exacerbating / Relieving factors
  - worse at rest :- inflammatory arthritis.
  - worse with exercise
    - intra-articular derangement.
    - osteoarthritic degeneration.
  - Both :- septic shock.
- Severity
  - sever Joint pain
    - Trauma
    - crystal (goat & pseudogoat).
    - septic arthritis.
  - Disproportionate pain
    - Acute :- compartment syndrome (↑ pressure in fascial compartment).
    - chronic :- Complex regional pain syndrome.
  - neurological involvement
    - pain free, sever deformity, impair Joint sensation.
    - examples
      - DM
      - Leprosy (Hansen's disease).
      - syringomyelia.
      - syphilis (tabes dorsalis)
      - charcot Joints
  - partial muscle tear :- painful.
  - complete muscle rupture :- ↓pain.
- patterns of Joints involvement
  - monoarthritis :- one Joint.
  - oligoarthritis :- 2-4 Joints.
  - polyarthritis :- >4 Joints.
- Notes
  - Hands & feet small Joints :- inflammatory arthritis
    - RA
    - SLE.
  - medium or Large Joints
    - Degenerative :- ostheoarthritis.
    - seronegative arthritis :- psoratic arthritis.
  - Distal interphalengeal (DIP) & carpometaccrpal (CMC) Joint of thumb :- nodal arthritis.

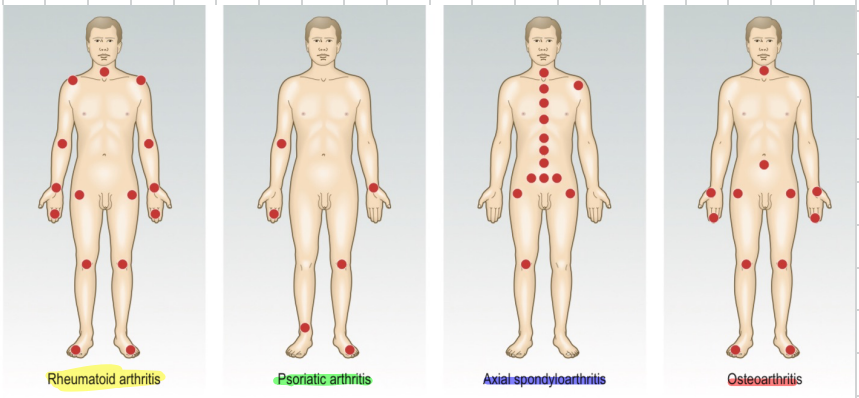


Fig. 13.3 Contrasting patterns of joint involvement in polyarthritis. A Rheumatoid arthritis (symmetrical, small and large joints, upper and lower limbs). B Psoriatic arthritis (asymmetrical, large>small joints, swelling of a whole digit = dactylitis, enthesitis). C Axial spondyloarthritis (spine and sacroiliac joints, asymmetrical peripheral arthritis, large>small joints, enthesitis). D Osteoarthritis (symmetrical, small and large joints, base of thumb, distal interphalangeal joints).

2 Stiffness

- Q
  - Restricted range of movement ?
  - Difficulty moving, but with a normal range ?
  - painful movement ?
  - Localized to a particular Joint or more generalized ?
- inflammatory type :- early morning stiffness for 30min which wears off with activity.
- mechanical (non-inflammatory) :- stiffness after rest that eases rapidly on movement.
- polymyalgia rheumatica :- mainly shoulder & pelvic stiffness
- Disease of soft tissues, rather than the Joint itself may cause stiffness.

3 Swelling

- Q
  - site
  - extent
  - time course.
  - onset.
- Rapid over 30 min :- Haemarthrosis
  - vascular structures (Bone, Ligament) are injured.
  - worse with anticoagulants or bleeding.
- over few hours (marked) :- septic Join
  - pain
  - marked swelling
  - tenderness
  - Redness
  - extreme reluctance to move the Joint actively or passively.
- over hours to days :- traumatic effusion
  - Meniscus tear
  - cartilaginous (articular cartilage abrasion).
- crystal arthritis → start overnight (↑serum-urate following evening meal) & on early morning.
- corticosteroids & NSAID modify these features.

4 Erythema & warmth

- occurs in :- almost in all types of arthritis
  - infective
  - traumatic
  - crystal-induced

  all effected Joint will be warm
- mild :- inflammatory arthritis.
- erythema + DIP swelling
  - psoriatic arthritis

  - not Heberden's node in osteoarthritis

5 Weakness :- focal or generalised.

- Joint disorder :- pain (↓function) or structure disruption or it's supporting structure.
- Nerve disorder :- entrapment (eg :- CTS at wrist).
- Muscle disorder :- widespread with pain & fatigue → myositis or dermatomyositis (+Rash).
- endocrine disorders
  - such as
    - Hypothyroidsm.
    - excess of glucocorticoids.
  - proximal muscle weakness.

6 Locking & triggering

- True Locking :- incomplete range of motion from mechanical (anatomical) causes.
- pseudo-Locking :- incomplete range of motion due to pain.
- Triggering
  - Block to extension of finger which gives suddenly forced extension.
  - Adults :- ring or middle finger
    - nodular tendon thickening.
    - fibrous thickening of flexor sheath (chronic Low-grade trauma)
      - it may be occupational or associated with inflammatory.
  - Congenital :- thumb.

7 Extra-articular symptoms:-

- Rashes
  - occurs with
    - psoariasis
    - vasculitis.
    - erythema nodosum.
  - photosensitive (SLE).
- weigh loss, ↓fever, malaise → Rheumatoid Arthritis
  - SLE.
- High-spiking fever (evening) trash → Adult onset still's disease.
- Headache, Jaw pain on chewing & scalp tenderness → Temporal arteritis
- CT disease
  - Raynaud's phenomenon
  - Sicca symptoms:-dness of mouth & eyes.
  - Rashes
  - GI
    - dysphagia.
    - mouth ulcers.
  - RS
    - dyspnoea (interstitial Lung Disease).
    - pleural pain or effusion (RA).
  - Arthritis +IBD
    - Back pain & stiffness
    - abdominal pain
    - diarrhoea
    - Bloody stool.
    - mouth ulcers.

13.5 Extra-articular signs in rheumatic conditions

Condition	Extra-articular signs
Rheumatoid arthritis	Rheumatoid nodules, palmar erythema, episcleritis, dry eyes, interstitial lung disease, pleural ± pericardial effusion, small-vessel vasculitis, Raynaud's phenomenon, low-grade fever, weight loss, lymphadenopathy, splenomegaly, leg ulcers
Psoriatic arthritis	Psoriasis, nail pitting, onycholysis, enthesitis, dactylitis
Reactive arthritis	Urethritis, mouth and/or genital ulcers, conjunctivitis, iritis, enthesitis (inflammation of tendon or ligament attachments), e.g. Achilles enthesitis/plantar fasciitis, rash (keratoderma blenorrhagica)
Axial spondyloarthritis	Inflammatory bowel disease, psoriasis, enthesitis, iritis, aortic regurgitation, apical interstitial fibrosis
Septic arthritis	Fever, malaise, source of sepsis, e.g. skin, throat, gut
Gout	Tophi, signs of renal failure or alcoholic liver disease
Sjögren's syndrome	'Dry eyes' (keratoconjunctivitis sicca), xerostomia (reduced or absent saliva production), salivary gland enlargement, Raynaud's phenomenon, neuropathy
Systemic lupus erythematosus	Photosensitive rash, especially on face, mucocutaneous ulcers, alopecia, fever, pleural ± pericardial effusion, diaphragmatic paralysis, pulmonary fibrosis (rare), Raynaud's phenomenon, lymphopenia
Systemic sclerosis	Skin tightening (scleroderma, see Fig. 3.30C), telangiectasia, Raynaud's phenomenon, calcific deposits in fingers, dilated nail-fold capillaries, pulmonary fibrosis
Adult-onset Still's disease	Rash, fever, hepatomegaly, splenomegaly
Other	Erythema nodosum of shins in sarcoidosis, viral rashes, drug rashes

13.7 Drugs associated with adverse musculoskeletal effects

Drug	Possible adverse musculoskeletal effects
Glucocorticoids	Osteoporosis, myopathy, osteonecrosis, infection
Statins	Myalgia, myositis, myopathy
Angiotensin-converting enzyme inhibitors	Myalgia, arthralgia, positive antinuclear antibody
Antiepileptics	Osteomalacia, arthralgia
Immunosuppressants	Infections
Quinolones	Tendinopathy, tendon rupture

• past medical & Drugs

- episodes of musculoskeletal involvment.
- extra-atricular diseases
- fractures.
- complicating comorbidites (DM & obesity).

• Family History

- First degree relative :- inflammatory type (inflammatory arthritis).
- variable polygenic fashion
  - osteoarthritis.
  - osteoporosis.
  - gout.
- HLA B27 → Spondyloarthritis.
- single gene defect (monogenic)
  - marfan's syndrome.
  - Ehler-Danlos syndrome.
  - sensorimotor neuropathy (charcot-Marie-tooth disease)
  - osteogenesis imperfecta.
  - muscular dystrophies.

• Social, enviromental & occupational History

- Ligatation may be pending following injury & occupational disorders
  - Repetitive strain disorder.
  - Hand vibration syndrome.
  - Fatigue fracture
- Smoking
  - Rheumatoid arthritis.
  - inflammatory arthritides.
- Alchol
  - ↑falls & fractures
  - myopathy.
  - neuropathy.
  - rhabdomyolysis.

- ethnic group
  - Sickle cell disease :- Africa.
  - osteomalacia :- Asian.
  - TB :- Both.
- Sexual History
  - reactive arthritis
  - gonococcal arthritis
  - HIV.
  - Hepatitis B.

Social , environmental and occupational history :

- How does the condition affect the patient's activities of daily living, such as washing, dressing and toileting?
- Can they use the stairs and do they need walking aids? Ask about functional independence, especially cooking, shopping and housework.
- Ask about current and previous occupations. Is the patient working full- or part-time, on sick leave or receiving benefits?
- Has the patient had to take time off work because of the condition and is their job at risk?

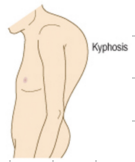
• Spine

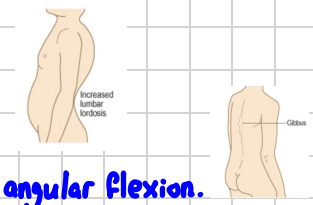
- Divided into
  - cervical
  - thoracic .
  - Lumbar.
  - Sacral.
- affect multiple segments
  - altered posture.
  - Function of whole spine.
- occurs without Local symptoms
  - Referred pain.
  - neurological symptoms.
  - signs in the trunk or Limbs.

13.9 Common spinal problems

- Mechanical back pain
- Prolapsed intervertebral disc
- Spinal stenosis
- Ankylosing spondylitis
- Compensatory scoliosis from leg-length discrepancy
- Cervical myelopathy
- Pathological pain/deformity, e.g. osteomyelitis, tumour, myeloma
- Osteoporotic vertebral fracture resulting in kyphosis (or rarely lordosis), especially in the thoracic spine with loss of height
- Cervical rib
- Scoliosis
- Spinal instability, e.g. spondylolisthesis

- Scoliosis:- Lateral curvature of the spine.
- Kyphosis
  - sagittal curvature (Anterior - posterior) plane +apex posterior.
  - mild Kyphosis:- thoracic spine.
- Lordosis
  - Sagittal curvature +apex Anterior.
  - normal Lordosis may lost in
    - ankylosing.
    - spondylitis.
    - Lumbar disc protusion.
- Gibbus:- anterior wedge deformity of a single vertebra → Localised angular flexion.





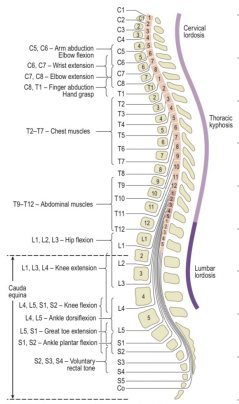


Fig. 13.11 The normal spinal curves and root innervations.

1 cervical spine

- movements
  - Nodding:- Atlanto-occipital Joints.
  - Rotation:- Atlanto-axial Joint.
  - flexion ,extension,Lateral flexion :- midcervical LvL
- History
  - pain (most common)
    - felt posteriorly.
    - referred to Head,shoulder,arm,interscapular.
  - cervical disc lesion → one arm or the other → dermatomes.
  - cervical myelopathy (spinal cord)
    - UMN Leg weakness.
    - altered sensation.
    - sphincter disturbance.

13.10 Causes of abnormal neck posture

Loss of lordosis or flexion deformity	
• Acute lesions, rheumatoid arthritis, trauma	
Increased lordosis	
• Ankylosing spondylitis	
Torticollis (wry neck)	
• Sternocleidomastoid contracture, trauma	
• Pharyngeal/parapharyngeal infection	
Lateral flexion	
• Erosion of lateral mass of atlas in rheumatoid arthritis	

The neural canal contains the spinal cord and the emerging nerve roots, which pass through exit foramina bounded by the facet joints posteriorly and the intervertebral discs and neurocentral joints anteriorly. The nerve roots, particularly in the lower cervical spine, may be compressed or irritated by lateral disc protrusion or by osteophytes arising from the facet or neurocentral joints. Central disc protrusions may press directly on the cord

2 Thoracic spine

- The Least mobile segment of the spine, physiological Kyphosis.
- Movement
  - mainly rotational.
  - ↓flexion & extention & Lateral flexion.
- History
  - Localised spinal pain Radiates round the chest wall.
  - cord compression
    - UMN Leg weakness (paraparesis)
    - sensory Loss
    - Loss of bladder or bowel control.
  - Disc Lesion (rare) → pain radiates around the chest, mimic cardiac & pleural disease.
  - osteoporotic vertebral fracture
    - acute pain.
    - or painless Loss of Hight + ↑Kyphosis

13.11 Causes of thoracic spine pain

Adolescents and young adults	
• Scheuermann's disease	• Disc protrusion (rare)
• Axial spondyloarthritis	
Middle-aged and elderly	
• Degenerative change	• Osteoporotic fracture
Any age	
• Tumour	• Infection

- vertebral collapse:- cord compression by malignancy.
- infection:- acute pain + systemic upset or fever.
- poorly localised thoracic pain :- intrathoracic causes → MI
  - oesophageal or pleural pain
  - aortic aneurysm.

3 Lumbar Supine

- Anatomy
  - Spinous processes of Lu/L5 are LvL with pelvic brim.
  - The dimples of venus overlie the sacroiliac Joints.
  - The spinal cord ends at the L_2 LvL.
- movements
  - flexion, extention, Lateral flexion, rotation.
  - flexion:- upper segments move first → smooth Lumbar curve.
  - Rigid Lumbar spine:- pt. may be able to touch their toes if their hip are mobile
- History
  - pain
    - Low back pain → mechanical (most common).
      - caused by → degenerative changes in disc.
        - facet Joint (spondylosis).
      - Q → occupational or recreational activity?
        - Red flag features ?
        - prior treatment with glucocorticoids?
    - Radical pain → caused by sciatica.
    - Buttock pain → axial spondyloarthritis.
    - Groin pain :- +abs of Hip abnormality → Reffered pain from L_{1-2}
    - consider abdominal & retroperitoneal pathology:- AAA.

• Mechanical	• Unremitting pain
• Inflammatory	• Intermittent pain
• Acute pain: young, elderly, constitutional symptoms	• Claudication
	• Emergencies

13.12 'Red flag' and 'yellow flag' features for acute low back pain

'Red flag' features
Features that may indicate serious pathology and require urgent referral

History
- Age <20 years or >55 years
- Recent significant trauma (fracture)
- Pain:
  - Thoracic (dissecting aneurysm)
  - Non-mechanical (infection/tumour/pathological fracture)
- Fever (infection)
- Difficulty in micturition
- Faecal incontinence
- Motor weakness
- Sensory changes in the perineum (saddle anaesthesia)
- Sexual dysfunction, e.g. erectile/ejaculatory failure
- Gait change (cauda equina syndrome)
- Bilateral 'sciatica'

Past medical history
- Cancer (metastases)
- Previous glucocorticoid use (osteoporotic collapse)

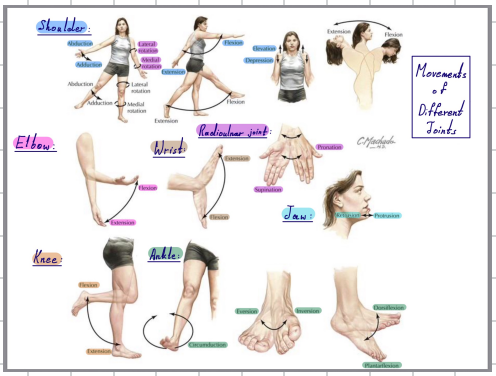
System review
- Weight loss/malaise without obvious cause, e.g. cancer

'Yellow flag' features
Psychosocial factors associated with greater likelihood of long-term chronicity and disability
- A history of anxiety, depression, chronic pain, irritable bowel syndrome, chronic fatigue, social withdrawal
- A belief that the diagnosis is severe, e.g. cancer. Faulty beliefs can lead to 'catastrophisation' and avoidance of activity
- Lack of belief that the patient can improve leads to an expectation that only passive, rather than active, treatment will be effective
- Ongoing litigation or compensation claims, e.g. work, road traffic accident

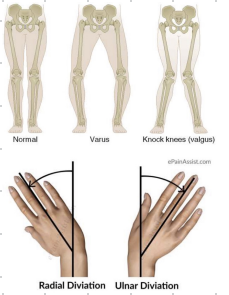
- mechanical
  - After standing too long or sitting poor position.
  - worse at end of the day & improve on Resting, Rising up on morning.
  - Acute disc prolapse (slipped disc) :- acute, young age, ↑ by coughing & straining.
  - osteoporotic fracture :-
    middle age & elderly, comorbidites, ↑ by movement, Localized, ↓ by Lying, Risk as glucocorticoid, + neurological symptoms.
  - Degenerative disc :-
    chronic, intermittent, + stiffness (morning) <30 min, ↓ by gentle activity but recur with excessive activity.
  - Lumbosacral canal stenosis:-
    diffuse pain in buttocks & thighs (standing & walking) with numbness, ↓ by rest & spinal flexion, ↑ by spinal extention.
- non-mechanical
  - inflammatory:-
    insidious onset, ↑ at morning, ↓ with movement, stiffness Last 30 min after activity, Age example (axial spondyloarthritis), Buttock ache
  - infection :- acute, progressive, not related to activity, + constitutional symptoms .
    - sever:- + malaise
    - ↓weight, night sweat:- pyogenic or tuberculous.
    - painful flexed Hip or groin swelling:- psoas muscle sheath.
  - malignancy:- insidious, unremitting pain, weight Loss, sleep disturbances.
- caud-eguina
  - central prolapse or space-occupying Lesion compress the cauda eguina. (neurosurgical emerge
  - disturbances
    - motor :- paraplegia
    - sensory:- perianal sensation
    - Bladder function.

physical examination

- overall apperance → pallor, rash, tightening & hair change
  - special posture
- Look → deformity & abnormality
  - skin, subcutaneous tissue & bony outline
- Feel → palpate each structure.
  - Before palpating :- pain or tenderness? warm, swelling.
- move :- active then passive movement.
- note → compare sides.
  - expose the Joint above & below the affected one.
  - if suspected systemic disease, examine all Joint & systems fully.

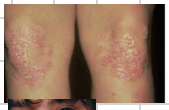


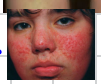
- Flexion :- bending at a Joint from the nature position.
- Extension :- straightening a Joint back to the natural position.
- Hyperextension → moving beyond the normal neutral position.
  - indicating a torn Ligament or Ligamentous Laxity (Benign Joint hypermobility syndrome).
- adduction → moving towards the midline of the body.
  - finger adduction is movement towards the axis of the limb.
- abduction :- moving away from the midline.
- valgus :- distal part deviates away from midline.
- varus :- distal part deviates towards the midline.
- radial deviation :- distal part deviates towards radial side.
- ulnar deviation :- distal part deviates towards ulnar side.



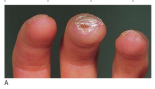
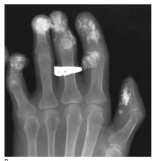
1 Skin, nail & soft tissues

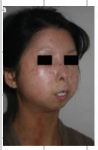
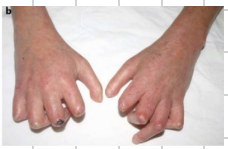
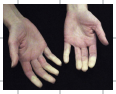
- psoriasis → may be hidden in umbilicus, natal cleft or scalp.
  - nasal pitting & oncholysis



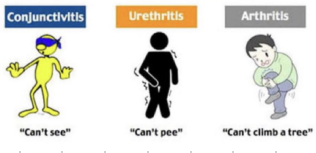


- SLE :- rash across the cheeks & bridge of nose (Butterfly rash).
- small, dark-red spot → due to :- capillary infract.
  - occurs in → rheumatoid arthritis (nail fold).
    - Systemic vesculitis (Lower Legs).
    - SLE.
- Systemic sclerosis
  - face → thickened, tight skin
  - Hands → flexion contracture
    - Ca^{2+} deposition in finger pulps.
    - tissue ischemia → ulceration.
  - fingers → Raynaud's phenomenon.
    - pulp atrophy.
    - ulceration.
  - Telangiectasies :- purplish, blanch with pressure, Hands & face.

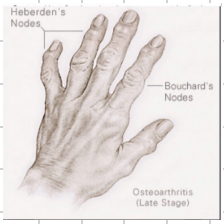




- Reactive arthritis
  - conjuctivitis
  - urethritis
  - circinate balenitis :- painless superficial ulcer on prepuce & glans.
  - Superficial mouth ulcers.

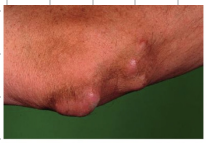


2 Nodules

- osteoarthritis → Heberden's node's :- Lateral aspect of DIP
  - Bouchard's node's - PIP
  - smaller & harder than Rheumatoid nodules.

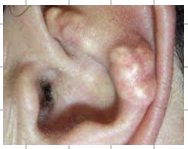


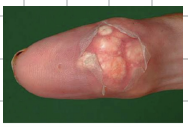
- Rheumatoid arthritis
  - Firm, non-tender, subcutanous nodules
  - extensor surface of forearm & sites of pressure or friction
    - Sacrum
    - Achilles tendon
    - Lungs.
  - multiple small nodules can occur on hands.
  - associated with
    - Rheumatoid factor
    - ⊕ anti-cyclic citrulinated peptide (anti-ccp) antibody.

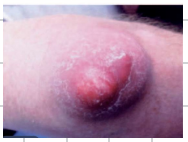


13.7 Rheumatoid nodules at the olecranon and ulnar border.

- Gout tophi
  - firm, irregular subcutanous crystal collections (monosodium urate monohydrate).
  - common sites
    - olecranon bursa.
    - Helix of ear.
    - extensor fingers
    - Hands, Knee, toes.
  - Superficial :- white, may ulcerate, discharge crystals → sencondarily infected.

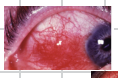






3 eye presentation

- Redness
  - conjunctivitis :- Reactive arthritis
  - Dry eye
    - Sjögren's syndrome
    - Rheumatoid arthritis
    - CT disorders
  - scleritis & episcleritis
    - Rheumatoid Arthritis.
    - psoriatic arthritis.



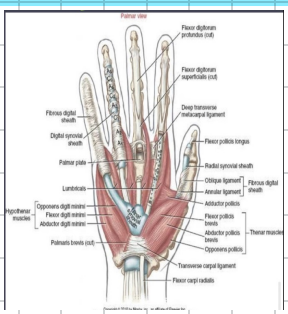
  - iritis (painful, very red) → axial spondyloarthritis

- Blue
  - osteogenesis imperfecta :- choroid plexus are not covered by collagen I.
  - scleromalacia of Long standing Rheumatoid Arthritis.

● weight loss, muscle loss, fever & Lymphoadenopathy :- features of systemic inflammatory arthritis & CT disease ●

● Hand & wrist

- Anatomy
  - metacarpal, macrocarpal, intercarpal, ulocarpal, radiocarpal.
  - PIP & DIP hinge Joints :- allow only flexion & extention.
  - MCP Joint
    - flexion/extention
    - adduction/abduction (MCP extended).
  - possible movements
    - flexion/extention
    - adduction :- divation towards ulnar side.
    - abduction :- divation towards radial side.
    - circumduction :- conical fashion.



- History
  - Localize complaints of
    - pain
    - stiffness
    - Loss of function
    - contractures
    - disfigurement (swelling)
    - Trauma.
  - if symptoms are more vague or diffuse
    - referred pain
    - compressive neuropathy (CTS).
  - functionality is very important (range of movement).
  - inflammatory arthritis :- prominant PIP or MCP swelling.

13.14 American College of Rheumatology/European League Against Rheumatism classification criteria for rheumatoid arthritis, 2010

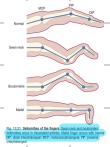
Criteria	Score
Duration of symptoms (as reported by patient)	
<6 weeks	0
>6 weeks	1
Joint distribution (0–5)	
1 large joint[a]	0
2–10 large joints	1
1–3 small joints[b] (large joints not counted)	2
4–10 small joints (large joints not counted)	3
>10 joints (at least 1 small joint)	5
Serology (0–3)	
Negative RF and negative ACPA	0
Low positive RF or low positive ACPA	2
High positive RF or high positive ACPA	3
Acute-phase reactants	
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1

Patients must have at least 1 swollen joint not better explained by another disease.
A score of ≥6 classifies the patient as having definite rheumatoid arthritis. A score of 4–5 is probable rheumatoid arthritis, i.e. a patient may have clinical rheumatoid arthritis but not fulfil all criteria.

[a]Large joints: shoulders, elbows, hips, knees and ankles
[b]Small joints: all metacarpophalangeal and proximal interphalangeal joints, thumb interphalangeal joint, wrists and 2nd–5th metatarsophalangeal joints.
ACPA, anti-cyclic citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.

- **Look**
  - colour changes
    - Erthema :- acute inflammatory, by
      - soft-tissue infection
      - septic arthritis
      - tendon sheath infection
      - crystal arthritis.
    - palmar Erythema :- Rheumatoid arthritis.
  - swelling
    - MCP due to synovitis → ↓interKuckle indentation on dorsum (↓ of normal hill-valley-hill).
    - spindling (tapering proximally & distally) → PIP affected.

  - Deformity
    - phalangeal fracture :- Rotation (MCP & IP flexed → cross & don't point to scaphoid tubercle).
    - Arachnodactyly (Long fingers) :- Marfan's syndrome
    - Boutonnière (Buttonhook) :- fixed flexion PIP + DIP hyperextention.
    - swan neck :- hyperextenion of PIP + DIP flexion.
    - mallet finger → DIP flexion that is passively correctable.
      - caused by trauma disrupting terminal extensor expantion at the base of distal phalanx ± bony avulsion.



  - vasculitis of the fingers
  - ulnar deviation.
  - Rheumatoid arthritis
    - Subluxation & ulnar divation at MCP
    - Anterior (volar) displacement (partial dislocation) of wrist.

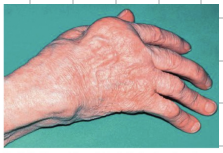


Fig. 13.22 **Advanced rheumatoid arthritis.** Small muscle wasting, subluxation and ulnar deviation at the metacarpophalangeal joints, boutonnière deformities at the ring and little fingers, and swelling and deformity of the wrist.

  - osteoarthritis → Bony expantion of DIP, PIP of fingers & CMC Joint of thumb.
  - Extra-articular signs
    - Dupuytren's contracture :- effect palmar fascia → fixed fixation of MCP & PIP.
    - wasting muscle
      - interossei in inflammatory arthritis & ulnar nerve palsy.
      - thenar eminence in CTS.
      - small Hand muscles by T_1 nerve root Lesion.
    - Nail → psoriatic arthritis
      - pitting
      - onycholysis
    - nail-fold infract.
    - telangiectasia.
    - psorasis
    - scars on CTS.
    - tendon transfer.
    - MCP Joint replacement.

- **feel**
  - Temperature
  - Tenderness :- palpate flexor tendon sheath.
  - Hard swelling (Bony) :- Heberden's & bouchard's nodes of OA.
  - Sponginess → soft swelling.
    - palpate above & below IP Joint.
    - squeeze MCP.
  - Trigger fingers
  - De Quervain's tenosynovitis → Finkelestein test.
    - causes → swelling
      - tenderness
      - crepitus (creaking sensation, may be audible).
    - in → tendor sheaths of abductor pollicus Longus
      - extensor pollicus brevis.
    - ↑ by :- movement.
  - crepitus
    - OA movement of radiocarpal
    - most commonly
      - secondary to old scapoid
      - distal radial fracture.

- Move
  - Active
    - Flexor digitorum profundus :- help PIP → flex DIP.
    - Flexor digitorum superficialis :- help other fingers → flex PIP.
    - Extensor digitorum :- extend fingers with wrist
    - Flexor & Extensor pollicus Longus :- hold thumb → flex & extend IP.
    - Extensor pollicus Longus :- flat surface → extend thumb (pain → de Quervian's).
    - test grip
    - prayer sign.
    - reverse prayer sign.
    - cheak
      - pronation / supination
      - flexion / extention
      - ulnar / radial deviation.

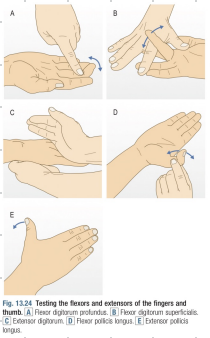
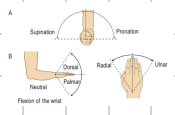
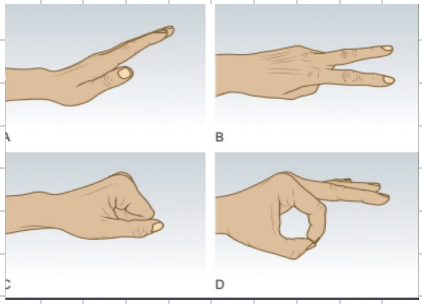


Fig. 13.24 Testing the flexors and extensors of the fingers and thumb. A | Flexor digitorum profundus. B | Flexor digitorum superficialis. C | Extensor digitorum. D | Flexor pollicis longus. E | Extensor pollicis longus.



  - passive
    - notice any loss of movement
    - note the range of movement & end-feel.
  - Radial nerve
    - wrist & fingers extensor.
    - paper sign.
  - ulnar nerve
    - supplies
      - Hypothenar muscle.
      - interossei
      - 2 medial Lumbricals
      - adductor pollicis.
      - flexor carpi ulnaris.
      - ulnar half of flexor digitorum.
    - scissor-sign.



  - median N
    - supplies
      - thenar M.
      - Lateral two Lumbricals
      - medial half of flexor digitorum profundus.
      - flexor digitorum superficialis.
      - flexor carpi radialis.
      - palmaris Longus
      - pronator teres.
    - stone-sign, abduct thumb away from palm.
  - Anterior interosseous N
    - supplies
      - flexor pollicis Longus
      - index finger flexor digitorum profundus.
      - pronator quadratus.
    - OK-sign
  - carpal tunnel syndrome (CTS)
    - Direct compression test → Distal to wrist crease (most sensetive)
    - Tinel's test → Tapping
    - phalen's test → flexion of both wrist (Reverse prayer sign).

Knee Joint

Anatomy

- Hinge Joint
  - +tibiofemoral & patellofemoral components.
  - Synovial capsule :- Suprapatellar pouch → 5cm above patella.
  - Largely subcutaneous allowing easy palpation on
    - patella
    - tibial tuberosity
    - patellar tendon
    - tibial plateau margin
    - femoral condyles.
  - Stability depends on
    - muscles
    - Ligaments.
- Extensor apparatus
  - parts
    - quadriceps M.
    - quadriceps tendon.
    - patella.
    - patellar tendon.
    - tibial tuberosity.
  - disruption → prevents straight-Leg raising
    - extensor Lag
  - The hamstring M :- flex the Knee.

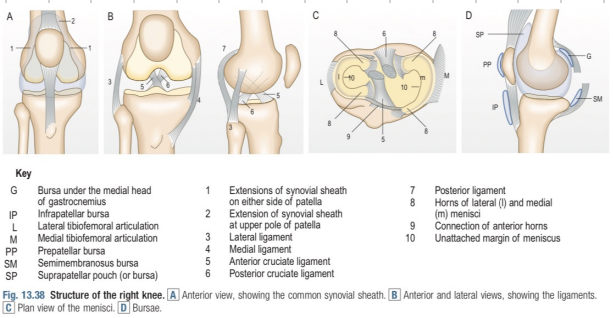
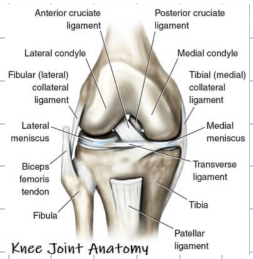


Fig. 13.38 Structure of the right knee. A Anterior view, showing the common synovial sheath. B Anterior and lateral views, showing the ligaments. C Plan view of the menisci. D Bursae.

- Stability
  - MCL :- resist valgus
  - LCL :- resist varus
  - ACL :- prevent Anterior subluxation of the tibia on femur.
  - PCL :- resist posterior translation.
  - Medial & Lateral menisci → crescentic fibrocartilangious structures
    - Lie btw tibial plateaux & femoral condyles.



Knee Joint Anatomy

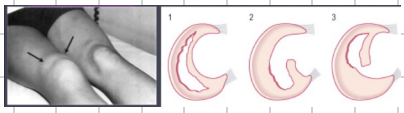
- Bursae
  - Anteriorly
    - Suprapatellar
    - prepatellar :- Btw patella & overlying skin.
    - infrapatellar :- btw skin & tibial tuberosity/patellar Ligament.
  - posteriorly :- several bursae in politeal fossa.

History

13.18 Bone conditions associated with pathological fracture

- Osteoporosis
- Osteomalacia
- Primary or secondary tumour
- Osteogenesis imperfecta
- Renal osteodystrophy
- Parathyroid bone disease
- Paget's disease

1. pain
   - generalised Knee pain :- pathology in tibiofemoral Joint
   - Anterior Knee pain → after prolonged sitting or going downstairs.
     - patellofemoral Joint pathology.
   - medial or Lateral pain → collateral Ligaments
     - meniscal tears
   - pain from Knee may be referred from the hip.



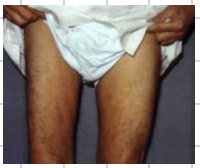
2. swelling
   - normal :- volume of synovial fluid 1-2 mL.
   - effusion :- intra-articular pathology.
   - Haemarthrosis → Bleeding into the Knee.
     - caused by :- injury to a vascular structure → cruciate Ligament.
       - intra-articular fracture.
     - Menisci → avascular (no heamarthrosis).
       - unless → torn at their periphery.
         - conjuction with other internal derangement.

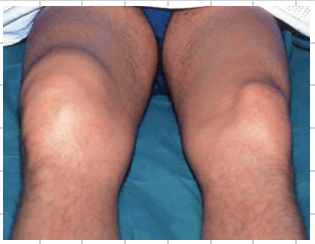
3 Locking
- Loose body
  - osteochondritis dissecans
  - osteoarthritis.
  - synovial chondromatosis.
- meniscal tear:- Local Joint-Line tenderness.
- Bucket-handle & anterior beak meniscal tear:- espically associated with Locking.
- posterior horn tear:- cause pain + Limit movement in Last dgree of flexion.
- congenital discoid meniscus:- Locking + clunking.

4 giving way (instability)
- 4 main Ligament
  - Rupture
  - incompetent with degenerative disease.
- patella:- prone to dislocate Laterally because the normal Knee has a valgus angle.

• physical examination

- LooK
  - gait & posture.
  - Scars sinuses, redness or rashes.
  - Deformities
    - genu valgum (Knock Knee).
    - genu valgus (Bow Legs)
  - muscle wasting
    - quadriceps wasting, invariable with
      - inflammation.
      - internal derangement.
      - chronic pain.
    - develops within days
    - measure:- 20 cm above tibial tuberosity.





  - Leg length discrepancy
  - Flexion deformity
    - if the pt. Lies with one Knee flexed.
    - caused by:- hip, Knee or combined problem.
  - Swelling
    - LooK for
      - Housemaid's Knee (enlarged prepatellar bursa).
      - Knee Joint effusion.
    - Large effusion → horseshoe-shaped swelling above the Knee.
    - swelling extending beyond Joint margins
      - infection.
      - major injury.
      - rarely tumor.
  - Baker's cyst
    - bursa enlargment in popliteal fossa.
    - vs aneursym:- not pulsatile.

- Kocher criteria for septic arthritis
  - fever > 38.5°C
  - ESR > 40 mm/h
  - WBC > 12,000 cell/mm³

- Feel
  - warmth
  - Effusion
  - patellar tap (modrate-sized effusion).
  - Ripple test (Bulge, milking):- effusion.
  - paratellar hollow
  - Synovitis
    - pt's Knee extended & quadriceps relaxed.
    - fell for sponginess of the quadriceps tendon.
  - Joint Lines
    - feel medial & Lateral Joint Lines.
    - tenderness → Localise this as accurately as possible in adolescents.
    - Localised tibial tuberosity tenderness
      - Osgood-Schlatter disease.
      - traction osteochondritis.

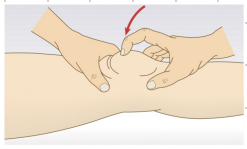


Fig. 13.39 Testing for effusion by the patellar tap.

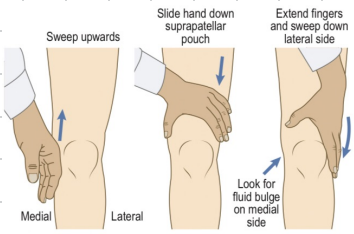


Fig. 13.40 Bulge or ripple test to detect small knee effusions.

- move
  - Active
    - position :- supine
    - Range of movement :- 0-140° (depends on muscle bulk).
    - Hands on Joint Lines :- feel for crepitus
      - chondromalacia patella (young female).
      - osteoarthritis.
    - extensor Lag examination.
  - passive
    - Normally :- knee can extend, femur & tibia are in longitudinal alignment (0).
    - restruction of full extention
      - meniscal tears.
      - osteoarthritis.
      - inflammatory arthritis.
    - hyperextention (Genu recurvatum) :- up to -10° degree is normal.
    - Block of full flexion → posterior horn menisci tear.
  - straight Leg Raise test (SLR)
    - test functionality of extensor apparatus.
    - detects fixed flexion deformity.

- Special test
  - Collateral Ligaments
    - varus
      - at 0° :- LcL, AcL, pcL
      - at 30° :- LcL only.
    - vagus
      - at 0° :- MCL, AcL, PcL
      - at 30° :- MCL only.
    - major opening of Joint → collateral & cruciate injury.
    - 30° to assess minor collateral Lexity (cruciate lig are not taut).

    . AcL :- Ant. cruciate Lig.
    . PcL :- post. cruciate Lig.
    . McL :- Medial collateral.
    . LcL :- Lateral collateral.

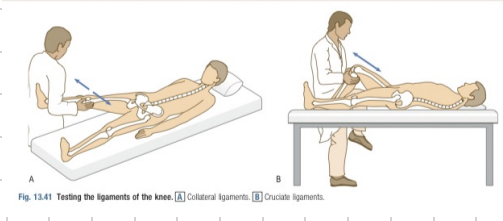


Fig. 13.41 Testing the ligaments of the knee. A Collateral ligaments. B Cruciate ligaments.

  - cruciate Ligaments
    - Anterior drawer (ACL)
      - significant movement → AcL is Lax.
      - >1.5cm movement → AcL rupture.
    - posterior drawer (PcL) :- posterior movement of tibia → PcL is Lax.
    - Lachmann test
      - intact AcL → prevent forward translational movement.
      - deficint AcL → allow forward translation without endpoint.
  - meniscal tear
    - young, sporty :- twisting injury to weight-bearing Leg.
    - middle age :- degenerative, horizontal cleavage + no history of trauma.
    - causes
      - effusions
      - Joint-Line tenderness.
    - meniscal provocation test (McMurray test)
      - medial meniscus
      - Lateral meniscus
  - patella
    - Look for prepatellar bursa swelling.
    - feel around pattela for tenderness
      - enthesitis
      - tendonitis.
    - patellar apprehension test.